LA-UR-20-21289
Approved for public release; distribution is unlimited.

Title: 6U SpaceVPX / OpenVPX Payload Processor

Author(s): Merl, Robert Bernard

Intended for: Share with industry

Issued: 2020-02-10

6U SpaceVPX / OpenVPX Payload Processor

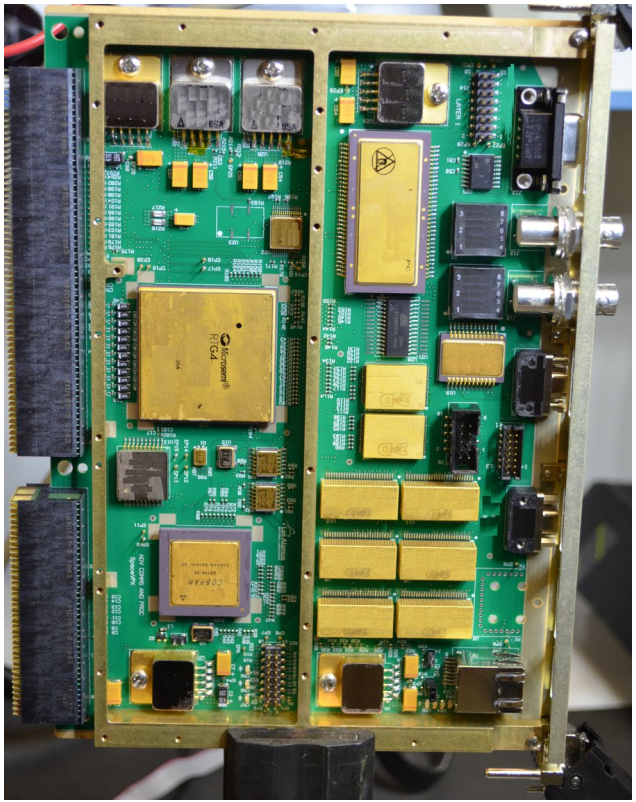
Rob Merl

February 2020

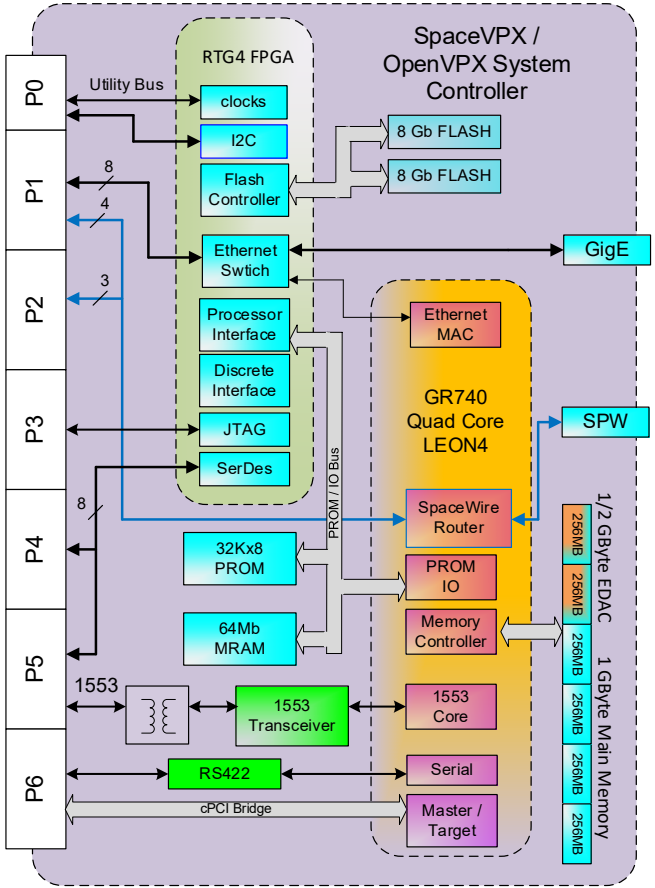
NNSA
National Nuclear Security Administration
Managed by Triad National Security, LLC for the U.S. Department of Energy's NNSA

Space Grade Single Board Computer

- 6U Eurocard VPX
  - 230 mm x 160 mm
  - Interoperable between OpenVPX and SpaceVPX
  - Complies with ANSI/VITA 65 and 78
    - SLT6-SWH-16U20F-10.4.2 and SLT6-SWC-12F16T-10.4.1 System Controller and Switch slot profiles
- For use in GEO / MEO / LEO Orbits
  - 100 Krad TID
  - latch up immune 103 MeV/mg/cm^2
  - Mechanically Hardened
  - Meets or exceeds NASA GEVS for shock, vibration, thermal
  - Conduction Cooled Frame
  - Hypertac Connectors
  - QMLV or Class S components
- Low Power / 8.5 W



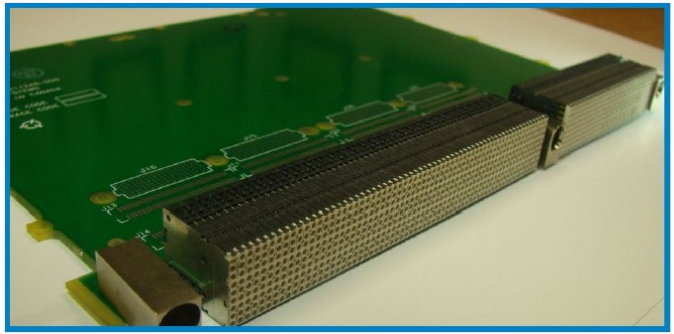
Flexible and Reconfigurable



- Quad Core LEON4 / GR740 Processor
  - GFLOP performance
  - 1 Gbyte SDRAM / 0.5 Gbyte EDAC
  - 2 Gbytes Non-Volatile Storage
  - PROM / MRAM / SDRAM memory hierarchy
- VxWorks RT Operating System
- Reconfigurable RTG4 FPGA
- Common Space Grade Interfaces
  - SpaceWire
  - I2C
  - discrete IO
  - MIL-STD-1553B
  - high speed serial

Commercial Interoperability

- Interoperates with commercial backplanes, enclosures, modules, and test equipment
- Can be inserted into flight like system late in design cycle
- Designed for assembly with low cost commercial VPX connectors or flight grade Hypertac in the same footprints



Los Alamos designed SpaceVPX System Controller in commercial system